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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/044,365	01/11/2002	Xiaobao Wang	015114-054910US	8233

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EXAMINER
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CHANG, DANIEL D

ART UNIT	PAPER NUMBER
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2819

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/044,365

Applicant(s)

WANG ET AL.

Examiner

Daniel D. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11212003
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

*Acknowledgement*

Receipt is acknowledged of the Amendment filed October 6, 2003.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 and 8-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 4,719,369) in view of Choe et al. (US 5,721,548).

Regarding claims 1 and 2, in figures 1 and 2, Asano teaches an integrated circuit comprising:

- a first transistor (20 or 21) coupled to an off-chip resistor (22 or 23, col. 4, lines 7+);
- an analog-to-digital converter (30) coupled to the first transistor;
- a digital encoder circuit (31) coupled to receive output signals of the analog-to-digital converter; and
- an impedance matching circuit (2-5, 7-10, 12-19) coupled to receive output signals of the digital encoder circuit, wherein the impedance matching circuit comprises a plurality of second transistors (2-5, 7-10) coupled in parallel.

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Asano does not specifically teaches that the analog-to-digital converter comprises comparators that compare a voltage at a terminal of the first transistor to a series of resistance values.

Choe teaches, in figure 1 (and/or 5) an analog-to-digital converter having comparators 20, and a string of resistors 10, for comparing a plurality of reference voltage with an analog input signal voltage  $V_a$  and generates sets of HIGH or LOW output signals (col. 1, lines 12+)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to have provided the output circuit of Asano with the analog-to-digital circuit as taught by Choe. It is an obvious matter of substitution of equivalence or design choice.

Regarding claim 3, in figures 1 and 2, Asano shows that the impedance matching circuit is coupled in parallel (2-5, 7-10) with an I/O pin (a common output node between transistors 5 and 10) of the integrated circuit.

Regarding claim 4, in figures 1 and 2, Asano shows that the impedance matching circuit is coupled in series (from VDD or GND to I/O pin) with an I/O pin (a common output node between transistors 5 and 10) of the integrated circuit.

Regarding claim 5, in figures 1 and 2, Asano shows that the impedance matching circuit is coupled to a buffer circuit (1, 6, 11) that is coupled to the I/O pin.

Regarding claim 6, in figures 1 and 2, Asano shows a plurality of impedance matching circuits (1<sup>st</sup> impedance matching circuit 2-5, 12-15; and 2<sup>nd</sup> impedance matching circuit 7-10, 16-19) coupled to receive output signals (26, 27) of the digital encoder circuit (a combination of 31 in 24 and 25), wherein the plurality of impedance matching circuits each comprises a plurality of transistors coupled in parallel (2-5 and 7-10).

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Regarding claims 8 , in figure 1 (and/or 5), Choe shows that the analog-to-digital converter comprises a plurality of resistors (10) that set threshold voltages for the plurality of comparators (20).

Regarding claims 9 and 10, in figures 1 and 2, Asano shows that the plurality of second transistors of the impedance matching circuit comprises four (2-5) or five (1-5) transistors coupled in parallel.

Method claims 11-20 are essentially the same in scope as apparatus claims 1-6 and 8-10 and are rejected similarly. Also claims 21-28 are rejected similarly.

Regarding claims 15 and 26, Asano or Choe does not show an encoder with NAND and NOR gates. However, a conventional encoder comprises NAND and NOR gates. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to have provided the encoder of Asano or Choe with an encoder with NAND and NOR gates. It is an obvious matter of design choice.

Claims 21-28 are rejected similarly with claims 1-10. Regarding the limitation, “programmable logic circuitry” in claim 21, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

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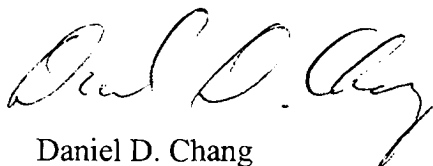
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel D. Chang whose telephone number is (703) 306-4549.

The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J. Tokar can be reached on (703) 305-3493. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Daniel D. Chang  
Primary Examiner  
Art Unit 2819

DC  
January 8, 2004

**DANIEL CHANG**  
**PRIMARY EXAMINER**